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EXAMINER

CARIASO, ALAN B

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/991,600	HAYASHI ET AL. <i>CH</i>
	Examiner Alan Cariaso	Art Unit 2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 July 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 5,6,8,9,13-16,20-23,34-58,64,65,67-70,72,76-79 and 81-145 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 5,6,8,9,13-16,20-23,34-58,64,65,72,76-79 and 81-139 is/are allowed.
- 6) Claim(s) 67,68,70,140,141 and 143-145 is/are rejected.
- 7) Claim(s) 69 and 142 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 22, 2003 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 143 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 143, the limitation "a recess at said end surface of said optical conductor, said electroluminescence device being formed in said recess" is indefinite as being structurally incompatible with the preceding limitation in claim 67 of "forming a light-permeable expander on said end surface of said optical conductor, said electroluminescence device being formed on said light-permeable expander".

Applicant's figures 22, 23B & 24 in the specification illustrate the electroluminescent device (37-figs.22,23B) formed on the light-permeable expansion (28) distinct and

independent from the electroluminescent device (37-fig.24) formed on the recess (27) without an expansion member.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 67 and 143 are rejected under 35 U.S.C. 102(b) as being anticipated by TOKUNAGA (US 5,375,043).

7. TOKUNAGA discloses a lighting device comprising an electroluminescent device (LEDs 2a-d, fig.1; some luminescent material of each LED mentioned on col.2, lines 53-61) which acts as a light source, an optical conductor (1) which introduces a light (fig.2) emitted from the electroluminescent device (2a-d) to a liquid crystal display device (3), the electroluminescent device (2-fig.2) formed on an end surface (1c-fig.2) of the optical conductor (1), a light-permeable expander (5-fig.4) on the end surface (fig.4) of the optical conductor (1), the electroluminescent device (2) being formed on the light-permeable expander (5-fig.4); given the claimed light device makes the method of fabricating the lighting device inherent, including forming the electroluminescent device on the end surface of the optical conductor and forming the light-permeable expander on the end surface of the optical conductor with the electroluminescent device formed

on the expander; forming a recess (hole(s) 1b, fig.4) at the end surface (fig.4) of the optical conductor (1), the electroluminescent device (2) being formed in the recess (1b).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 68 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over TOKUNAGA (US 5,375,043) in view of REDMOND et al (US 5,664,862) and PARKER et al (US 5,618,096).

10. TOKUNAGA does not disclose the light-permeable expander formed by injection molding and by ink-jet injection. REDMOND teaches a light guide (32) formed by injection molding (col.3, lines 43-44) for the purpose of forming a light guide (32) made of light transmissive plastic material that introduces light from an embedded lamp (diode 47) into an adjacent light guide panel (13, fig.1). PARKER teaches a method of ink-jet application of optical appendages (21, col.4, lines 46-61) to light guide panel member (2,20) for the purpose of forming integral deformities on the light panel member that modify the direction of light in the panel member.

11. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the light introducing member or expander integral with the light guide plate or panel device of TOKUNAGA formed by injection molding and in-

jet application as taught by REDMOND et al and PARKER et al, respectively, in order to form a transparent medium or material that direct light within light guides from light source(s) by such well-known common methods.

12. Claim 144 is rejected under 35 U.S.C. 103(a) as being unpatentable over TOKUNAGA (US 5,375,043) in view of SCHNONIGER et al (US 4,903,172).

13. TOKUNAGA does not disclose forming a reflector covering the end surface of the optical conductor. SCHNONIGER teaches a reflector (12) covering the end surface of the light conductor (10) adjacent the embedded LED or luminescent device (11) for the purpose of preventing emergence of light at the limiting edges (col.3, lines 53-54). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the lighting device of TOKUNAGA to include the step of forming or providing a reflector formed at the edge or end surface of the optical conductor as taught by SCHNONIGER et al in order to prevent light leakage in efficiently direct more light form the luminescent device towards the display.

14. Claim 145 is rejected under 35 U.S.C. 103(a) as being unpatentable over TOKUNAGA (US 5,375,043) in view of TIAO et al (US 6,254,246).

15. TOKUNAGA does not disclose the step of tapering the optical conductor at least one of upper and lower surfaces adjacent to the end surface. TIAO teaches the use of a tapered optical conductor (310-fig.4) that include tapering of at least one of the main surfaces (312,314) adjacent the end surface (312) associated with the

electroluminescent light sources (LEDs or EL; col.3, lines 7-11) for the purpose of internally reflecting incident light within the optical conductor (col.4, lines 47-61) reducing light loss from illuminating the display. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the lighting device of TOKUNAGA to include the type of tapered or inherent forming step of tapering the optical conductor as taught by TIAO et al in order to internally reflect incident light from the EL light source reducing light loss of incident light that would illuminate the display.

16. Claim 140 is rejected under 35 U.S.C. 103(a) as being unpatentable over SHIRASAKI et al (US 6,025,894).

17. SHIRASAKI discloses a liquid crystal display device (fig.37) comprising: a first substrate (212); a second substrate (211); a liquid crystal layer (217) sandwiched between the first and second substrates (212,211); a lighting device (303) emitting light (Y) through the first substrate (211), the liquid crystal layer (217) and the second substrate (211) in this order; an optical conductor (205) which introduces light emitted from a light source (204) to a liquid crystal display device (201) and a half-mirror (202) located between the first substrate (212) and the optical conductor (205). However, SHIRASAKI does not disclose an electroluminescent device being formed on an end surface of the optical conductor of the embodiment shown in fig.37.

18. SHIRASAKI does teach another embodiment having an electroluminescent device (101-fig.28, col.32) formed on an end surface (C or 123) of an optical conductor

(light guiding portions 121, col.33) for the purpose of forming a planar light emitting device that uniformly scatter back light toward the planar input surface area of the LCD while making use of external light to also back illuminate the LCD. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD lighting device of figure 37 of SHIRASAKI et al to include an electroluminescent device formed on an end surface of an optical conductor or light guide portion as taught by the embodiment of figure 28 of SHIRASAKI et al in order to uniformly scatter light toward the planar input surface of the liquid crystal display while making use of external light to also back illuminate the liquid crystal display.

19. Claim 141 is rejected under 35 U.S.C. 103(a) as being unpatentable over SHIRASAKI et al (US 6,025,894) in view of TAI et al (US 5,608,837).
20. SHIRASAKI discloses applicant's claimed invention except a brightness detector and controller. TAI teaches a brightness sensor (63) connected to a controller (65) for the purpose of sensing ambient light and controlling the dimming or activation of internal lights (18,48-figs.1-3) according to the ambient light sensed by the sensor (63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD-lighting device of SHIRASAKI et al to include a brightness sensor and controller as taught by TAI et al in order to control the amount of internal lighting of the LCD according to the ambient light sensed thereby insuring best visibility of the LC display in various and varying ambient light levels.

Allowable Subject Matter

21. Claims 5, 6, 8, 9, 13-16, 20-23, 34-58, 64, 65, 72, 76-79 and 81-139 are allowed.
22. Claims 69 and 142 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

23. Currently, independent claims 5, 6, 8, 13 and 72 are allowed along with their dependent claims 9, 14-16, 20-23 and that include newly submitted claims 81-139. Amended independent claims 34, 65 and 77 are now allowed since they incorporate subject matter indicated to be allowable, and therefore their dependent claims 35-58, 64, 76, 78 and 79 are also allowable. However, amended claim 67 includes subject matter that remains rejected by the prior art to TOKUNAGA, but now under USC 102 as being anticipated since it has been found that all limitations have been met by TOKUNAGA, including newly submitted dependent claim 143. Claims 68 and 70 are rejected under USC 103 in view of TOKUNAGA in view of newly cited art to REDMOND et al (US 5,664,862) and PARKER et al (US 5,618,096) regarding the obviousness of forming the expander by injection molding and ink-jet steps. Newly submitted dependent claims 144 and 145 are rejected under USC 103 in view of TOKUNAGA in view of SCHNONIGER et al (US 4,903,172) and TIAO et al (US 6,254,246), respectively, in regard to the end surface reflector and tapered optical conductor,

respectively. Newly submitted claims 140 and 141 are rejected under USC 103 in view of newly cited prior art to SHIRASAKI et al (US 6,025,894) in view of TAI et al (US 5,608,837).

24. In regards to amended claim 67, applicant argues on page 40 of the response that TOKUNAGA et al do not disclose, teach or suggest a light-permeable expander, only optical fibers 5 which transmit the light without expansion. In response, this argument is contradictory to the specification's indication (pg.8, lines 1-2) that the expansion is intended to reduce the dispersion angle of light emitted from the electroluminescence device, and that the expander or expansion has the general purpose (pg.31, lines 22-24) of introducing lights emitted from the electroluminescence device, into the optical conductor without loss. It is apparent the fibers 5 of TOKUNAGA produce that intended function. The claimed light-permeable expander is interpreted broadly as an optical device met by TOKUNAGA.

25. In regards to claim 140, applicant has stated on page 34 of the response that new claim 140 is analogous to previous claim 60 rewritten into independent form including all the limitations of previous claim 59. Applicant argues on page 35 of the response that the prior art to JP 10-50124 and MAEDA et al, formerly used in the last Office Action(s) to show disclosure of applicant's claimed half-mirror located between said first substrate and said optical conductor, neither teach or suggest the limitations of claim 140 of a half-mirror located between first and second substrates, as recited now by claim 140, because the reference numeral 16 in MAEDA et al is not a substrate but instead is a polarized light separator, as disclosed in column 29, lines 24-25. In

response, the part of the applicant's argument that claim 140 now recites a half-mirror located between first and second substrates, is incorrect because it is inconsistent with applicant's disclosure and claim true recitation that the half-mirror is located between the first substrate and the optical conductor as originally claimed. Furthermore, a substrate as claimed by the applicant is broadly interpreted as any integral material or substance as commonly or generically known which has been indicated to be appropriately anticipated by the polarized light separator of MAEDA et al. However, the examiner has newly cited the prior art to SHIRASAKI et al (US 6,025,894) which discloses applicant's first and second substrates intended to sandwich the closure of at least the liquid crystal layer, and further discloses a half-mirror between the first substrate and optical conductor, as written in the rejection of claim 140 above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. PARKYN JR. et al (US 5,806,955) (figs. 29-34) show LEDs or electroluminescent devices integral with lenses (1027,1027a) integral or attached to the edge of the plane 1040 (col.17, lines 13-17) of the waveguide (1025), and the waveguide tapering in shape (figs.32 & 34). TABATA et al (US 6,375,335) show a light guide (figs.1,7,11a,11b,12) having red, green and blue LED elements (31a,b,c) positioned on the end surface (12).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Cariaso whose telephone number is (703) 308-1952. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Alan Cariaso
Primary Examiner
Art Unit 2875

AC
August 11, 2003